

Patent Claims

1. Thermal pre-ignition agents for gas generators, characterised in that they contain from 10 to 100 wt.% dipicrylaminoethyl nitrate.
- 5 2. Thermal pre-ignition agents according to claim 1, characterised in that they contain from 0 to 90 wt.% of an additive or plurality of additives.
3. Thermal pre-ignition agents according to claim 2, characterised in that the additives are selected
10 from: nitroguanidine, nitroaminoguanidine, nitrotriazolone, derivatives of tetrazole and/or salts thereof, nitraminotetrazole and/or its salts, aminoguanidine nitrate, diaminoguanidine nitrate, triaminoguanidine nitrate, guanidine nitrate,
15 dicyandiamidine nitrate, diaminoguanidine azotetrazolate; nitrates of the alkali and/or alkaline earth metals and/or of ammonium, perchlorates of the alkali and/or alkaline earth metals and/or of ammonium, peroxides of the alkaline
20 earth metals and/or of zinc; aluminium, titanium, titanium hydride, boron, boron hydride, zirconium, zirconium hydride, silicon, graphite, activated carbon, carbon black; cellulose and/or derivatives thereof, polyvinylbutyrals, polynitropolyphenylene, polynitrophenyl ether, Plexigum, polyvinyl acetate
25 and copolymers; hexogen, octogen; ferrocene and/or derivatives thereof, acetylacetates, salicylates, silicates, silica gels, boron nitride.
4. Thermal pre-ignition agents according to one or more
30 of claims 1 to 3, characterised in that they contain from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly preferably from 40 to 60 wt.%, dipicrylaminoethyl nitrate and from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly

preferably from 40 to 60 wt.%, of an oxidising agent.

5. Thermal pre-ignition agents according to one or more of claims 1 to 4, characterised in that they contain
5 from 10 to 90 wt.%, preferably from 10 to 50 wt.%, particularly preferably from 10 to 30 wt.%, dipicrylaminoethyl nitrate, from 10 to 90 wt.%, preferably from 10 to 60 wt.%, particularly preferably from 20 to 40 wt.%, of a nitrogen-
10 containing compound and from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly preferably from 40 to 60 wt.%, of an oxidising agent.
6. Thermal pre-ignition agents according to one or more
15 of claims 1 to 5, characterised in that the oxidising agent is selected from one or more of the nitrates of the alkali and/or alkaline earth metals and/or of ammonium, of the perchlorates of the alkali and/or alkaline earth metals and/or of
20 ammonium, of the peroxides of the alkaline earth metals and/or of zinc.
7. Thermal pre-ignition agents according to one or more of claims 1 to 6, characterised in that the
25 nitrogen-containing compound is selected from one or more of nitroguanidine, nitroaminoguanidine, nitrotriazolone, derivatives of tetrazole and/or salts thereof, nitraminotetrazole and/or its salts, aminoguanidine nitrate, diaminoguanidine nitrate, triaminoguanidine nitrate, guanidine nitrate,
30 dicyandiamidine nitrate, diaminoguanidine azotetrazolate.
8. Thermal pre-ignition agents according to one or more of claims 1 to 7, characterised in that they contain from 1 to 80 wt.%, preferably from 1 to 40 wt.%,

particularly preferably from 1 to 15 wt.%, of a reducing agent.

- 5 9. Thermal pre-ignition agents according to one or more of claims 1 to 8, characterised in that the reducing agent is selected from one or more of aluminium, titanium, titanium hydride, boron, boron hydride, zirconium, zirconium hydride, silicon, graphite, activated carbon, carbon black.
- 10 10. Thermal pre-ignition agents according to one or more of claims 1 to 9, characterised in that they contain from 1 to 80 wt.%, preferably from 1 to 40 wt.%, particularly preferably from 1 to 20 wt.%, of a binder.
- 15 11. Thermal pre-ignition agents according to one or more of claims 1 to 10, characterised in that the binder is selected from one or more of cellulose and derivatives thereof, polyvinylbutyrals, polynitropolyphenylene, polynitrophenyl ether, Plexigum, polyvinyl acetate and copolymers.
- 20 12. Thermal pre-ignition agents according to one or more of claims 1 to 11, characterised in that they contain from 10 to 80 wt.%, preferably from 10 to 50 wt.%, particularly preferably from 10 to 30 wt.%, high-energy additives.
- 25 13. Thermal pre-ignition agents according to one or more of claims 1 to 12, characterised in that the high-energy additives are selected from one or more of hexogen, octogen and nitrocellulose.
- 30 14. Thermal pre-ignition agents according to one or more of claims 1 to 13, characterised in that they contain from 0.1 to 20 wt.%, preferably from 0.1 to 10 wt.%, combustion moderators and processing aids.

15. Thermal pre-ignition agents according to one or more of claims 1 to 14, characterised in that the combustion moderators and processing aids are selected from one or more of ferrocene and derivatives thereof, acetonylacetates, salicylates, silicates, silica gels and boron nitride.
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16. Use of a thermal pre-ignition agent according to one or more of claims 1 to 15 as thermal fuse in gas generators for motor vehicle safety systems.

Patent Claims

1. Thermal pre-ignition agents containing from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly preferably from 40 to 60 wt.%, dipicrylaminoethyl
5 nitrate and from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly preferably from 40 to 60 wt.%, of an oxidising agent.
2. Thermal pre-ignition agents containing from 10 to 90 wt.%, preferably from 10 to 50 wt.%, particularly
10 preferably from 10 to 30 wt.%, dipicrylaminoethyl nitrate, from 10 to 90 wt.%, preferably from 10 to 60 wt.%, particularly preferably from 20 to 40 wt.%, of a nitrogen-containing compound and from 10 to 90 wt.%, preferably from 25 to 75 wt.%, particularly
15 preferably from 40 to 60 wt.%, of an oxidising agent.
3. Thermal pre-ignition agents according to claim 1 or 2, characterised in that the oxidising agent is selected from one or more of the nitrates of the
20 alkali and/or alkaline earth metals and/or of ammonium, of the perchlorates of the alkali and/or alkaline earth metals and/or of ammonium, of the peroxides of the alkaline earth metals and/or of zinc.
4. Thermal pre-ignition agents according to claim 2
25 to 3, characterised in that the nitrogen-containing compound is selected from one or more of nitroguanidine, nitroaminoguanidine, nitrotriazolone, derivatives of tetrazole and/or salts thereof, nitraminotetrazole and/or its salts, aminoguanidine
30 nitrate, diaminoguanidine nitrate, triaminoguanidine nitrate, guanidine nitrate, dicyandiamidine nitrate, diaminoguanidine azotetrazolate.
5. Thermal pre-ignition agents according to one or more
35 of claims 1 to 4, characterised in that they contain from 1 to 80 wt.%, preferably from 1 to 40 wt.%,

particularly preferably from 1 to 15 wt.%, of a reducing agent, preferably selected from one or more of aluminium, titanium, titanium hydride, boron, boron hydride, zirconium, zirconium hydride, silicon, graphite, activated carbon, carbon black.

6. Thermal pre-ignition agents according to one or more of claims 1 to 5, characterised in that they contain from 1 to 80 wt.%, preferably from 1 to 40 wt.%, particularly preferably from 1 to 20 wt.%, of a binder, preferably selected from one or more of cellulose and derivatives thereof, polyvinylbutyrals, polynitropolyphenylene, polynitrophenyl ether, Plexigum, polyvinyl acetate and copolymers.

7. Thermal pre-ignition agents according to one or more of claims 1 to 6, characterised in that they contain from 10 to 80 wt.%, preferably from 10 to 50 wt.%, particularly preferably from 10 to 30 wt.%, high-energy additives, preferably selected from one or more of hexogen, octogen and nitrocellulose.

8. Thermal pre-ignition agents according to one or more of claims 1 to 7, characterised in that they contain from 0.1 to 20 wt.%, preferably from 0.1 to 10 wt.%, combustion moderators and processing aids, preferably selected from one or more of ferrocene and derivatives thereof, acetylacetates, salicylates, silicates, silica gels and boron nitride.

9. Use of a thermal pre-ignition agent according to one or more of claims 1 to 8 as a thermal fuse in gas generators for motor vehicle safety systems.